

CLAIMS

1. Portable working machine comprising a tool unit (1) with a circular, disc-shaped tool (3), which can be rotated about an axis of rotation (4), which is horizontal in the normal upraised position of the machine, and a machine unit (2), which includes at least a filter system (10), which is at least partly accommodated in a top part of the machine unit, an internal combustion engine (11) with an engine cylinder (13) with bore (12) having a centre line (30), a crankshaft (14) and a crankcase (15), an assembly (16) comprising members for supplying air and fuel to the engine, a fuel tank (17), a muffler (18), handles (19,20), controls (21,22), and preferably supports (23,24) on the underside of the machine unit for allowing upright positioning of the machine on a flat ground, and a power transmission between the machine unit and the tool unit, characterised in that the cylinder bore (12) is inclined forwards in a direction towards the tool unit, such that the centre line (30) of the cylinder bore forms a tilt angle (α) larger than zero, in said direction, to a perpendicular to any or both of the following lines:
- a) a base line (33), which is a line coinciding with a horizontal surface on which the machine is resting in an upright position, when said supports on the underside of the machine unit contact said surface, and
 - b) a tangential line (33') extending from a peripheral point of the tool, on the lower part of the tool when the machine has an upright position, to the bottom side of a rear support (24) of the machine unit.
2. Machine according to claim 1, characterised in that the tilt angle to said perpendicular to the base line is 5-40 degrees.
3. Machine according to claim 2, characterised in that the tilt angle to said perpendicular to the base line is 5-30 degrees.
4. Machine according to claim 3, characterised in that the tilt angle to said perpendicular to the base line is 10-20 degrees.

5. Machine according to claim 1, characterised in that the tilt angle to said perpendicular to the tangential line is 7-40 degrees.
6. Machine according to claim 5, characterised in that the tilt angle to said perpendicular to the tangential line is 7-30 degrees.
7. Machine according to claim 6, characterised in that the tilt angle to said perpendicular to the tangential line is 10-25 degrees.
8. Machine according to claim 7, characterised in that the tilt angle to said perpendicular to the tangential line is 13-23 degrees.
9. Machine according to any of claims 1-8, characterised in that the centre line of the engine cylinder forms an angle of inclination (β) to a connection line (34) between the axis of rotation (4) of the tool and the axis of rotation (31) of the crankshaft, said angle of inclination being smaller than 80 degrees.
10. Machine according to claim 9, characterised in that said angle of inclination to said connection line is 45-70 degrees.
11. Machine according to claim 10, characterised in that said angle of inclination to said connection line is 50-65 degrees.
12. Machine according to any of claims 1-11, characterised in that a front side (41)s of the engine (11) as seen in a plane through the centre line (30) and perpendicular to the axis of rotation (4) of the tool (3) lies in an inclined plane which is substantially parallel with the inclined centre line of the engine cylinder, and that the muffler is accommodated in a space which has the substantial shape of a triangle in a cross section of said space perpendicular to said axis of rotation (4) and located behind a disc guard (5), which triangle has one corner pointing upwards when the machine has an upright position, a front side (53) facing the tool unit, a rear side (52), at least a top part of which is facing said inclined front side of the engine, and a base side (51) which faces said base line.

13. Machine according to claim 12, characterised in that the muffler substantially occupies said space having the substantial shape of a triangle in cross section.

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14. Machine according to claim 12 or 13, characterised in that the contour of the muffler in said cross section has a point of balance (centre of gravity) having a position at a level which is lower than the level of the axis of rotation of the crankshaft, when the machine is in an upright position.

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15. Machine according to any of claims 12-14, characterised in that at least 60 %, and preferably at least 80 %, of a front side of the muffler faces the tool unit within a sector of a circle of 60 degrees, said sector (γ) having its centre in the centre of the tool,

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an upper border line which is horizontal, and a lower border line in a downwards-rearwards direction, when the machine is in an upraised position.

16. Machine according to claim 15, characterised in that the sector beneath said horizontal border line corresponds to a sector angle which is not smaller than 35 degrees, preferably not smaller than 40 degrees.

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17. Machine according to any of claims 15-16, characterised in that the front side (45) of the muffler is concave and that it is essentially parallel with the periphery of the tool within said sector.

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18. Machine according to any of claims 12-17, characterised in that at least the main part of the upper part of a rear side (42) of the muffler faces and is essentially parallel with the inclined front side of the engine (11).

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19. Machine according to claim 18, characterised in that a lower part of the rear side of the muffler faces and is essentially parallel with the front side of a member (43) extending in a substantially vertical direction under the crankcase.

20. Machine according to any of claims 1-19, characterised in that the contour of the muffler has a shape in cross section in a plane perpendicular to the axes of rotation of the tool and of the crankshaft, approximately corresponding to the contour of a pear.

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21. Machine according to any of claims 1-20, characterised that the centre line of the cylinder forms an angle (δ) of 10-45 degrees, preferably 15-30 degrees to a line extending between and defined by the foremost point of the top part of the machine unit and the foremost point of the muffler.

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22. Machine according to any of claims 12-21, characterised in that a rear bottom part (55) of the muffler protrudes rearwards under the crankcase.

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23. Machine according to any of claims 1-22, characterised in that a front bottom part (60) of the fuel tank protrudes forwards under the crankcase.

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24. Machine according to any of claims 1-23, characterised in that a front side (61) of the protruding part (60) of the fuel tank faces the rear side of the protruding muffler part (55).

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25. Machine according to claim 24, characterised in that a heat insulation (64) is provided in a gap (63) between the lower parts of said front and rear sides of the fuel tank and muffler, respectively.

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26. Machine according to any of claims 21-25, characterised in that the crankcase is accommodated in a space (67) above said rearward and forwards extending parts of the muffler and the fuel tank, respectively, and between said rear, forwards inclined side of the muffler and a front, rearwards inclined side of the fuel tank.

27. Machine according to any of claims 1-26, characterised in that said assembly (16) for supplying air and fuel to the engine are accommodated in a space (70) of the machine unit above the fuel tank and at the rear of the inclined cylinder block.

28. Machine according to any of the preceding claims, characterized in that a spark plug (6) of the internal combustion engine is located in the front top part of the machine unit, adjacent to the front top corner.

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29. Machine according to any of the preceding claims, characterized in that the engine is a crankcase scavenged two-stroke engine and that additional air is supplied to the transfer channels from an air inlet (76) via at least one connecting duct (78).

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